National Institute of Environmental Health Sciences

Understanding the link between malaria risk and climate

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Abstract:

The incubation period for malaria parasites within the mosquito is exquisitely temperature-sensitive, so that temperature is a major determinant of malaria risk. Epidemiological models are increasingly used to guide allocation of disease control resources and to assess the likely impact of climate change on global malaria burdens. Temperature-based malaria transmission is generally incorporated into these models using mean monthly temperatures, yet temperatures fluctuate throughout the diurnal cycle. Here we use a thermodynamic malaria development model to demonstrate that temperature fluctuation can substantially alter the incubation period of the parasite, and hence malaria transmission rates. We find that, in general, temperature fluctuation reduces the impact of increases in mean temperature. Diurnal temperature fluctuation around means >21 degrees C slows parasite development compared with constant temperatures, whereas fluctuation around

Source: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2720408

Resource Description

Exposure : ☑

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Temperature

Temperature: Fluctuations

Geographic Feature: ☑

resource focuses on specific type of geography

Other Geographical Feature

Other Geographical Feature : highlands

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Africa

African Region/Country: African Country

Other African Country: Kenya

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Vectorborne Disease

Vectorborne Disease: Mosquito-borne Disease

Mosquito-borne Disease: Malaria

Model/Methodology: ☑

type of model used or methodology development is a focus of resource

Exposure Change Prediction, Methodology

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Short-Term (